WHAT IS CLAIMED IS

1. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a core that receives the high power optical energy; and

an absorber adjacent to an end of the fiber or waveguide, such that the optical energy is impinged on the absorber, creating a scattering end tip, the absorber being heated to a temperature of at least 100°C.

2. The optical hot tip of claim 1 wherein the absorber comprises a first conductive layer for scattering and absorbing the optical energy.

3. The optical hot tip of claim 2 wherein the absorber further comprises a second conductive layer and a dielectric between the first and second conductive layers.

4. The hot tip of claim 2 wherein the absorber comprises a laser-plasma type absorber.

5. The hot tip of claim 2 wherein the core comprises a conically-shaped end.

6. The optical hot tip of claim 1 wherein the absorber comprises a scattering core that receives the high power optical energy and an absorbing layer at least partially surrounding the scattering core to conduct the high power energy away from the scattering core.

7. The optical hot tip of claim 6 wherein the absorbing layer is placed at a distance of up to 100 microns from the scattering core.

8. The optical hot tip of claim 6 wherein the absorbing layer has a surface area of approximately 100 times of the surface area of the scattering core.

9. The optical hot tip of claim 6 wherein the absorbing layer comprises at least one of a black paint and a black epoxy.

10. The optical hot tip of claim 1 wherein the absorbing layer comprises at least one of tantalum and molybdenum.

11. The optical hot tip of claim 6 wherein the scattering core comprises a fiber fuse-type core.

12. The optical hot tip of claim 1, further comprising a layer of cladding between the scattering core and the absorbing layer.

13. The optical hot tip of claim 1 wherein the absorber comprises a metal.

14. The optical hot tip of claim 1 wherein the absorber is heated to a temperature of from 100°C to about 150°C.

15. The optical hot tip of claim 1 wherein the absorber is heated to a temperature of at least 1000°C.

16. The optical hot tip of claim 1 wherein the absorber is heated to a temperature of from about 1000°C to about 1200°C.

17. The optical hot tip of claim 1 wherein the absorber is adapted to heat an external surface.

18. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a scattering core that receives the high power optical energy; and

an absorbing layer at least partially surrounding the scattering core to conduct the high power energy away from the scattering core, the absorbing layer being in contact with the fiber or waveguide.

19. The hot tip of claim 18 wherein the absorbing layer has a surface area of approximately 100 times of the surface area of the scattering core.

20. The hot tip of claim 18 wherein the absorbing layer heats to a temperature from about 100°C to about 150°C.

21. The hot tip of claim 18 wherein the absorbing layer heats to a temperature from about 1000°C to about 1200°C.

22. The hot tip of claim 18 wherein the absorbing layer comprises a metal made from tantalum, molybdenum, or a combination thereof.

23. The hot tip of claim 18 wherein the scattering core comprises a fiber fuse-type core.

24. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a scattering core that receives the high power optical energy; and

an absorbing layer at least partially surrounding the scattering core to conduct the high power energy away from the scattering core, the absorbing layer being heated to a temperature of at least 100°C.

25. The hot tip of claim 24 wherein the absorbing layer has a surface area of approximately 100 times of the surface area of the scattering core.

26. The hot tip of claim 24 wherein the absorbing layer heats to a temperature from 100°C to about 150°C.

27. The hot tip of claim 24 wherein the absorbing layer heats to a temperature from about 1000°C to about 1200°C.

28. The hot tip of claim 24 wherein the absorbing layer comprises a metal made from tantalum, molybdenum, or a combination thereof.

29. The hot tip of claim 24 wherein the scattering core comprises a fiber fuse-type core.

30. The optical hot tip of claim 24 wherein the absorbing layer directly abuts the fiber or waveguide.

31. The optical hot tip of claim 24 wherein the absorbing layer is spaced at a distance of up to 100 microns from the scattering core.

32. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a scattering core that receives the high power optical energy; and

an absorbing layer at least partially surrounding the scattering core to conduct the high power energy away from the scattering core, the absorbing layer having a surface area that is approximately 100 times of the surface area of the scattering core.

33. The hot tip of claim 32 wherein the absorbing layer heats to a temperature from 100°C to about 150°C.

34. The hot tip of claim 32 wherein the absorbing layer heats to a temperature from about 1000°C to about 1200°C.

35. The hot tip of claim 32 wherein the absorbing layer comprises a metal made from tantalum, molybdenum, or a combination thereof.

36. The hot tip of claim 32 wherein the scattering core comprises a fiber fuse-type core.

37. The optical hot tip of claim 32 wherein the absorbing layer directly abuts the fiber or waveguide.

38. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a core that receives the high power optical energy; and

a first conductive layer adjacent to an end of the fiber or waveguide, such that the optical layer is impinged on the first conductive layer, creating a scattering end tip.

39. The hot tip of claim 38, further comprising a second conductive layer and a dielectric layer between the second conductive layer and the first conductive layer.

40. The hot tip of claim 38 wherein the scattering end tip heats to a temperature of at least 1000°C

41. The hot tip of claim 38 wherein the temperature of the scattering end tip is heated to a temperature of from about 1000°C to about 1200°C.

42. The hot tip of claim 38 wherein the first conductive layer comprises a metal made from rhodium, aluminum, gold, silver, chromium, nickel or a combination thereof.

43. The hot tip of claim 38 wherein the scattering end tip comprises a laser plasma-type end tip.

44. The hot tip of claim 38 wherein the scattering end tip is adapted to heat an external surface.

45. The hot tip of claim 38 wherein the scattering end tip is a core-less end tip.

46. The hot tip of claim 38 wherein an end of the core is conical.

47. An optical hot tip for absorbing high optical energy traveling in a fiber or waveguide, comprising:

a means for absorbing light from the fiber in a predetermined volume in order to generate heat.

48. The optical tip of claim 47 wherein the means for absorbing light comprises a scattering core and an absorbing layer.

49. The optical tip of claim 47 wherein the means for absorbing light comprises a conductor.

50. A method for manufacturing an optical hot tip for conducting high optical power beams at the tip of a fiber or waveguide, comprising:

absorbing the light from the fiber or waveguide in an end tip in order to generate heat.

51. The method of claim 51 wherein the absorbing step comprises:

providing a scattering core in the fiber or waveguide that scatters the light impinging on the scattering core; and

providing an absorbing layer, the absorbing layer adjacent to the fiber or waveguide for conducting the absorbed heat.

52. The method of claim 51 wherein providing the scattering core comprises:

emitting a high-energy laser into a large core fiber/waveguide;

flowing the emitted light into a narrowed fiber/waveguide to increase its power per unit area to a level above a fiber use threshold; and

impinging the increased power, emitted light on a contaminating deposition which initiates a fiber fuse backward effect along the narrowed fiber/waveguide to damage the narrowed fiber/waveguide through the production of bubbles along a core of the narrowed fiber/waveguide.

53. The method of claim 50 wherein the absorbing step comprises:

providing a core that receives the high power optical energy; and

providing a first conductive layer adjacent to an end of the fiber or waveguide, such that the optical layer is impinged on the first conductive layer such that a scattering end tip is created.

54. The method of claim 53 wherein creating the scattering end tip comprises:

emitting a high-energy laser into a core of the fiber or waveguide, the laser having an optical power exceeding a predetermined threshold;

impinging the emitted light on the first conductive layer, creating a plasma for increasing the absorption of the emitted light;

creating damaged sections on the first conductive layer.

55. A method for manufacturing an optical hot tip for conducting high optical power beams at the tip of a fiber or waveguide, comprising:

providing a scattering core in the fiber or waveguide that scatters the light impinging on the scattering core;

providing an absorbing layer, the absorbing layer adjacent to the fiber or waveguide for conducting the absorbed heat; and

heating the absorbing layer to a temperature of at least 100°C.

56. The method of claim 55 wherein providing the scattering core comprises:

emitting a high-energy laser into a large core fiber/waveguide;

flowing the emitted light into a narrowed fiber/waveguide to increase its power per unit area to a level above a fiber use threshold; and

impinging the increased power, emitted light on a contaminating deposition which initiates a fiber fuse backward effect along the narrowed fiber/waveguide to damage the narrowed fiber/waveguide through the production of bubbles along a core of the narrowed fiber/waveguide.

57. The method of claim 55 wherein the heating comprises heating the absorbing layer from 100°C to about 150°C.

58. The method of claim 55 wherein the heating comprises heating the absorbing layer from about 1000°C to about 1200°C.

59. A method of manufacturing a hot tip for conducting high optical power beams at the tip of a fiber or waveguide, comprising:

providing a core that receives the high power optical energy;

creating a scattering end tip by providing a first conductive layer adjacent to an end of the fiber or waveguide, such that the optical layer is impinged on the first conductive layer; and

heating the scattering end tip to an elevated temperature.

60. The method of claim 59 wherein the step of creating the scattering end tip comprises:

emitting a high-energy laser into a core of the fiber or waveguide, the laser having an optical power exceeding a predetermined threshold;

impinging the emitted light on the first conductive layer, creating a plasma for increasing the absorption of the emitted light;

creating damaged sections on the first conductive layer.

61. The method of claim 59 wherein the step of providing the core comprises providing a conical core.

62. The method of claim 59 wherein the creating the scattering end tip further comprises providing a second conductive layer and placing a dielectric between the first and second conductive layers.

63. A method of using a hot tip, the hot tip having a scattering end tip in the fiber or waveguide that scatters and absorbs the light impinging on the scattering end tip, the method comprising:

heating the scattering end tip such that the absorbing volume conducts the absorbed heat;

placing the scattering end tip in contact with an external material; and

heating the external material.

64. The method of claim 63 wherein the external material is an external fluid and the heating the external material comprises heating the external fluid to a predetermined temperature.

65. The method of claim 63 wherein the external material is a fuel-air mixture and the step of heating the external material includes heating the fuel-air mixture.

66. The method of claim 65 wherein the step of heating further comprises igniting the fuel-air mixture.

67. The method of claim 63 wherein the external material is an explosive or pyrotechnic and the step of heating the external material comprises heating the explosive or pyrotechnic.

68. The method of claim 67 wherein the step of heating the external material further includes igniting the explosive or pyrotechnic.

69. The method of claim 63 wherein the external material includes live tissues and the step of heating the external material comprises optically the heat live tissues.

70. The method of claim 69 wherein the step of heating the external material further comprises cutting the live tissue.